Achieving Efficient and Secure Data Acquisition for Cloud-supported Internet of Things in Smart Grid

ABSTRACT

With the support of modern information technologies like the Internet of Things (IoT) and cloud computing, smart grid has emerged as the next-generation power supply network, in which the electricity is generated according to the real-time demands of electric equipment or household appliances. The IoT front-ends are responsible for data acquisition and status supervision, while the substantial amount of data is stored and managed in the cloud server. Achieving data security and system efficiency in the data acquisition and transmission process are of great significance and challenging, because the power grid-related data is sensitive and in huge amount. In this paper, we present an efficient and secure data acquisition scheme based on CP-ABE (Ciphertext Policy Attribute Based Encryption). Data acquired from the terminals will be partitioned into blocks and encrypted with its corresponding access sub-tree in sequence, there by the data encryption and data transmission can be processed in parallel. Furthermore, we protect the information about the access tree with threshold secret sharing method, which can preserve the data privacy and integrity from users with the unauthorized sets of attributes.

EXISTING SYSTEM

With the support of modern information technologies like the Internet of Things (IoT) and cloud computing, smart grid has emerged as the next-generation power supply network, in which the electricity is generated according to the real-time demands of electric equipment or household appliances.To make the smart grid more intelligent, a great number of IoT terminals are deployed to gather the status of the power grid timely for the control center. Some sample applications are such as the power transmission line monitoring, power generation monitoring, substation state monitoring, smart metering, electric energy data acquisition, smart home. For instance, in power transmission line monitoring scenario, using preplaced sensors, the status parameters of the transmission line and power towers can be gathered in real time, so that any fault can be diagnosed and located in a timely manner. In smart grid, the different kinds of

applications mentioned above all generate an enormous amount of data, which needs to be stored and managed efficiently. Cloud-IoT is proposed to address this issue .with the support of cloud computing, mass data from different IoT terminals can be collected and processed by local front-end servers, then transferred and stored in the cloud servers. The data in cloud can be accessed by various types of data users. The power grid staff can continually monitor the status of power grid. Researchers and government agencies can analyze the data for research or policymaking.

DRAWBACKS

- The efficiency of data acquisition should be considered due to the large amount of data to be encrypted/decrypted and transferred. It's critical to ensure an acceptable the data acquisition time.
- Data security is less
- Data privacy is minimized.

PROPOSED SYSTEM

In this paper, we present an efficient and secure data acquisition scheme based on CP-ABE (Ciphertext Policy Attribute Based Encryption). Data acquired from the terminals will be partitioned into blocks and encrypted with its corresponding access sub-tree in sequence, thereby the data encryption and data transmission can be processed in parallel. Furthermore, we protect the information about the access tree with threshold secret sharing method, which can preserve the data privacy and integrity from users with the unauthorized sets of attributes. The formal analysis demonstrates that the proposed scheme can fulfill the security requirements of the Cloud-supported IoT in smart grid. The numerical analysis and experimental results indicate that our scheme can effectively reduce the time cost compared with other popular approaches.

ADVANTAGES

- Data security there by privacy of our data is enhanced.
- It reduces response time overhead

SYSTEM REQUIREMENTS

H/W System Configuration:-

- Processor - Pentium –IV
- RAM - 4 GB (min)
- Hard Disk - 20 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA

S/W System Configuration:-

- Operating System : Windows 7 or 8 32 bit
- Application Server : Tomcat5.0/6.X
- Programming Language : Java
- Java Version : JDK 1.6 and above